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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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# TECHNICAL REPORT

# ON

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

# FOR

ASSEMBLER (laund.) 9-57.21
FLATWORK CATCHER (laund.) 9-57.21
FLATWORK FEEDER (laund.) 9-57.21
FLATWORK FOLDER (laund.) 9-57.21
LAUNDRY COLLECTOR (laund.) 9-57.21

B-537 S-260

(Supersedes B-313)

TM 001 906

U. S. Employment Service in
Cooperation with
California, Colorado, Oregon, Utah and Washington
State Employment Services

June 1963

GATB #2436

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

ASSEMBLER (laund.) 9-57.21
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LAUNDRY COLLECTOR (laund.) 9-57.21

B-537

**(Supersedes B-313)**

## Summary

The General Aptitude Test Battery, B-1002, was administered to two samples of employees for the purpose of validating and cross-validating occupational norms for the above occupations. The following listing shows the year in which data collection was completed, the number included in each final sample and the type of criterion data obtained.

| Sample | Year | N | Criterion |
|---|---|---|---|
| Validation (California) | 1962 | 75 | Supervisory ratings |
| Cross-Validation (Colorado, Oregon, Utah and Washington) | 1954 | 74 | Supervisory ratings |

On the basis of the quantitative and qualitative analyses of the data, Aptitude K-Motor Coordination and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21, Flatwork Folder 9-57.21 and Laundry Collector 9-57.21, B-537 (Supersedes B-313).

| B-1001 | | | B-1002 | | |
|---|---|---|---|---|---|
| Aptitude | Tests | Minimum Acceptable Aptitude Score | Aptitude | Tests | Minimum Acceptable Aptitude Score |
| T | CB-1-G<br>CB-1-K | 75 | K | Part 8 | 80 |
| M | CB-1-M<br>CB-1-N | 80 | M | Part 9<br>Part 10 | 80 |

## Effectiveness of Norms

The data in Table IV-A indicate that only 67 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 85 percent would have been good workers. 33 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 15 percent would have been poor workers.

TECHNICAL REPORT

## I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupations of Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21, Flatwork Folder 9-57.21 and Laundry Collector 9-57.21.

## II. Sample

### Validation Sample (California)

The General Aptitude Test Battery, B-1002B, was administered during the period of July 26 to September 27, 1962 to 42 male and 48 female laundry workers employed by the Los Angeles County General Hospital System, Los Angeles and Downey, California. A total of 90 persons were tested and 15 were eliminated from the final sample because they did not understand or follow test instructions. Therefore, the final sample consists of 75 individuals; 34 male and 41 female.

Applicants for laundry jobs at the Los Angeles County General Hospital System must pass a Los Angeles County Civil Service "General Knowledge" test by answering 21 of 30 questions correctly, equivalent to a 70% on the written portion of the test, to qualify for an oral interview. The oral interview is conducted by a member of the personnel department of the hospital and a section foreman of the laundry staff. In the oral interview, the applicant is appraised on personal traits and fitness. In selection for employment, no experience is required and no education stipulations are stated but applicants must be at least 18 years of age.

On-the-job training consists of 1 to 3 days for all workers under the close supervision of the section supervisor or floorlady. The probationary period is six months. All workers in the sample perform comparable work, have completed the six month probationary period, and are considered experienced workers.

TABLE I-A

Means (M), Standard Deviations ($\sigma$), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

Validation Sample (California)

| N = 75 | M | $\sigma$ | Range | r |
|---|---|---|---|---|
| Age (years) | 35.5 | 11.8 | 19-59 | -.113 |
| Education (years) | 10.8 | 1.7 | 7-15 | .085 |
| Experience (months) | 61.0 | 60.4 | 6-247 | .090 |

Cross-Validation Sample (Colorado, Oregon, Utah and Washington)

The General Aptitude Test Battery, B-1002A, was administered between July 1953 and August 1954 to 83 women employed as laundry workers by the American Linen Supply Company in Salt Lake City and Ogden, Utah; Denver, Colorado; Portland, Oregon; and Tacoma, Washington. Nine of the 83 women tested were eliminated from the final sample because of lack of experience, advanced age, or inability to complete the tests. For the final sample, the number tested in each city and the dates of testing are as follows:

| | No. Tested | Date |
|---|---|---|
| Denver, Colorado | 20 | July 1954 |
| Portland, Oregon | 18 | August 1954 |
| Ogden, Utah | 10 | April 1954 |
| Salt Lake City, Utah | 19 | July 1953 |
| Tacoma, Washington | 7 | August 1954 |
| | 74 | |

The American Linen Supply Company, a national organization, has plants in eleven western cities. The workers in each of the plants are used interchangeably on the jobs of Continuous Towel Roller, Flatwork Catcher, Flatwork Feeder and Flatwork Folder. Therefore, because of the job interchangeability of the workers and the availability of comparable criterion data, the group of 74 laundry workers comprised the final sample.

The training period for this job is considered to be approximately 4 weeks. All workers in the final sample had been on the job at least 8 weeks and are therefore considered experienced.

TABLE I-B

Means (M), Standard Deviations ($\sigma$), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience
Cross-Validation Sample (Colorado, Oregon, Utah and Washington)

| N = 74 | M | $\sigma$ | Range | r |
|---|---|---|---|---|
| Age (years) | 38.4 | 9.6 | 21-54 | -.005 |
| Education (years) | 9.0 | 1.7 | 6-13 | -.029 |
| Experience (months) | 53.7 | 61.4 | 2-336 | .120 |

III. Job Description

Job Title: Assembler (laund.) 9-57.21, Flatwork Catcher (laund.) 9-57.21, Flatwork Feeder (laund.) 9-57.21, Flatwork Folder (laund.) 9-57.21, Laundry Collector (laund.) 9-57.21.

Job Summary: Picks up and sorts clean, soiled, or contaminated laundry; folds, counts and bundles laundry; operates flat work ironer.

Work Performed: Sorts, shakes and stacks laundry to prepare for pressing: Stands beside laundry cart and pulls out clean, damp laundry. Shakes out laundry pieces and tosses into specified bin or spreads and stacks according to type. Picks up sorted laundry and stacks on table in front of flatwork ironer.

Places flatwork pieces on feeder-roller of spreader: Takes clean, damp laundry pieces from cart, shakes and spreads or stacks pieces and places one end of each piece on feeder-roller of spreader.

Smooths and guides material as it is drawn into ironer: Stands or sits in front of ironer; lifts damp, clean laundry from table in front of spreader or laundry sorters. Straightens and pulls on edges and corners of article to remove wrinkles, and places on conveyor belt leading into ironer. Guides articles to feed in straight line into ironer by holding corners and sides of article until first roller of ironer engages it, and simultaneously reaches for next item. Observes and reads speed meter. Adjusts control lever to maintain prescribed speed as necessary. Pushes down metal arm on ironer to stop movement as necessary.

Folds, stacks, and counts laundry articles: Stands or sits to receive pressed laundry pieces, such as flatwork or surgical gowns and cloths, as they emerge from delivery apron of ironer. Folds and stacks laundry with gloved hands. Inspects articles by sight and may feel article to determine if dry; sets damp articles aside for re-ironing. Counts number of items in each stack and records on tally sheet. Places stacks of folded laundry pieces on table.

Sorts, folds and bundles rough-dry laundry: Stands at table heaped with clean, dry laundry and sorts laundry pieces, such as baby blankets, baby clothes, hospital gowns and pajamas, bath towels, wash cloths and rags. Smooths, folds, stacks, counts, and ties laundry pieces into bundles. Records number of items in each bundle. Stuffs rags or wash cloths into paper or cloth laundry bags.

Picks up soiled linen at hospital, delivers to laundry building, and sorts laundry articles preparatory to washing: Operates a tram over specified route to pick up bags of soiled linen from specified locations. Returns bags to laundry room and dumps soiled laundry onto conveyor belt. Sorts laundry according to type as it passes on conveyor belt.

IV. Experimental Battery

All the tests of the GATB, B-1002 (Form A-validation sample; Form B-cross-validation sample) were administered to the two sample groups.

V. Criterion

Validation Sample (California)

The criterion data collected consisted of two sets of independent ratings made by the first-line supervisor on an adaptation of USES Form SP-21, "Descriptive Rating Scale." A period of at least two weeks elapsed between the first and second ratings; all ratings were made between August and December 1962. The rating scale consisted of five items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. A reliability coefficient of .78 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final criterion scores of 14-42, with a mean of 30.2 and a standard deviation of 6.0.

Cross-Validation Sample (Colorado, Oregon, Utah and Washington)

The criterion data collected consisted of two sets of independent ratings made by the first-line supervisor on an adaptation of USES Form SP-21, "Descriptive Rating Scale." The rating scale consisted of five items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives.

The reliability of the ratings were obtained by one of two methods. In plants where two supervisors were acquainted with the workers tested, each supervisor rated the workers independently. In plants where only one supervisor knew the workers, two independent ratings were obtained. The following subsample reliability coefficients for the criterion were obtained:

| | |
|---|---|
| Ogden | .952 |
| Portland | .606 |
| Salt Lake City | .957 |
| Tacoma | .848 |

Although averages based on the two sets of independent ratings were available for the Denver subsample, the data for each set of independent ratings were not provided. Therefore, the reliability of coefficient for the criterion data for the Denver subsample could not be computed. The reliability coefficients cited above indicate considerable agreement between the two sets of ratings at each plant. Therefore, the two sets of ratings were averaged, resulting in a distribution of final criterion scores of 6.5-23.5, with a mean of 16.6 and a standard deviation of 3.8.

## VI. Qualitative and Quantitative Analyses

### A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Motor Coordination (K) - required in rapidly and accurately placing garments in machine, making sure garments are properly spread so that no wrinkles will be ironed into garment.

Manual Dexterity (M) - required in shaking, sorting, folding, and stacking laundry; in tieing bundles of laundry; and in feeding and guiding material into ironer and spreader.

On the basis of the job analysis data, V-Verbal Aptitude was rated "irrelevant" for success in this occupation.

B. Quantitative Analysis: **Validation Sample** (California)

TABLE II

Means (M), Standard Deviations ($\sigma$), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 75

| Aptitudes | M | $\sigma$ | r |
|---|---|---|---|
| G-Intelligence | 71.9 | 12.8 | .075 |
| V-Verbal Aptitude | 79.0 | 10.6 | .191 |
| N-Numerical Aptitude | 68.9 | 15.7 | .075 |
| S-Spatial Aptitude | 81.3 | 16.0 | -.096 |
| P-Form Perception | 76.1 | 21.6 | .149 |
| Q-Clerical Perception | 82.8 | 14.4 | .102 |
| K-Motor Coordination | 91.2 | 20.0 | .014 |
| F-Finger Dexterity | 79.9 | 19.5 | .121 |
| M-Manual Dexterity | 90.7 | 21.4 | .23* |

*Significant at the .05 level

C. Selection of Test Norms: **Validation Sample** (California)

TABLE III

Summary of Qualitative and Quantitative Data

| Type of Evidence | Aptitudes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | G | V | N | S | P | Q | K | F | M |
| Job Analysis Data | | | | | | | | | |
| Important | | | | | | | X | | X |
| Irrelevant | | X | | | | | | | |
| Relatively High Mean | | | | | | X | X | | X |
| Relatively Low Sigma | X | X | | | | X | | | |
| Significant Correlation with Criterion | | | | | | | | | X |
| Aptitudes to be Considered for Trial Norms | | | | | | Q | K | | M |

Trial norms consisting of various combinations of Aptitudes Q, K and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of K-80 and M-80 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 33 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV-A shows the relationship between test norms consisting of Aptitudes K and M with critical scores of 80 and 80, respectively, and the dichotomized criterion for Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21, Flatwork Folder 9-57.21, and Laundry Collector 9-57.21 for the validation sample. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV-A

Validity of Test Norms for Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21, Flatwork Folder 9-57.21, and Laundry Collector 9-57.21
(K-80, M-80)
Validation Sample (California)

| N = 75 | Non-Qualifying Test Scores | Qualifying Test Scores | Total |
|---|---|---|---|
| Good Workers | 17 | 33 | 50 |
| Poor Workers | 19 | 6 | 25 |
| Total | 36 | 39 | 75 |

Phi Coefficient = .40

$X^2$ = 11.775

P/2 < .005

The data in Table IV-A indicate a significant relationship between the test norms and the criterion for the Validation sample.

Cross-Validation

Table IV-B shows the relationship between test norms consisting of Aptitudes K and M with critical scores of 80 and 80, respectively, and the dichotomized criterion for the cross-validation sample. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV-B

Cross-Validation of Test Norms for
Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21,
Flatwork Folder 9-57.21, Laundry Collector 9-57.21

(K-80, M-80)

Cross-Validation Sample
(Colorado, Oregon, Utah and Washington)

| N = 74 | Non-Qualifying Test Scores | Qualifying Test Scores | Total |
|---|---|---|---|
| Good Workers | 9 | 40 | 49 |
| Poor Workers | 12 | 13 | 25 |
| Total | 21 | 53 | 74 |

Phi Coefficient = .31
$X^2$ = 7.178
P/2 < .005

The data in the above table indicate a significant relationship between the test norms and the criterion for the Cross-Validation sample.

Conclusions

On the basis of the results of this study, Aptitudes K and M with minimum scores of 80 and 80, respectively, have been established as B-1002 norms for Assembler 9-57.21, Flatwork Catcher 9-57.21, Flatwork Feeder 9-57.21 Flatwork Folder 9-57.21 and Laundry Collector 9-57.21. The equivalent B-1001 norms consist of T-75 and M-80.

Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.